

Application of the UTAUT Model to Understand Factors Influencing the use of Web 2.0 Tools in e-learning in Kenyan Public Universities

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ABSTRACT

The introduction of Web 2.0 tools has led to enhanced communication and collaboration in both social and academic environments. The focus of this study was to identify factors influencing the use of Web 2.0 tools in e-learning in Kenyan Public Universities. The tools can then be introduced and used to aid in successful collaborative learning. A descriptive survey research design was used. Data was collected through questionnaires from both students and lecturers. Purposive sampling was used for the selection and the respondents, who included e-learning instructors and students. A total of 48 lecturers and 136 students participated in the study. The results of the study showed that the most common tools used for e-learning in Kenyan Public Universities were social networks, which included YouTube and Facebook. It was also interesting to note how learners perceived the tools. The major challenges relating to these tools were also identified. Finally, Performance expectancy was identified as the main factor influencing the use of Web 2.0 tools in Public Universities in Kenya.

Keywords: *E-learning, learning management systems, unified theory of acceptance and use of technology*

1. INTRODUCTION

As technology evolves, there is a shift in learning towards virtual learning, mobility and ubiquity. This moves the focus away from attending the traditional physical classroom to the flexibility of learning from anywhere at any time. This evolution has given rise to faster retrieval of learning materials through the Internet and Web portals. E-learning refers to the use of the Internet and related technologies to aid in the training and learning processes. Garrison [1] defines e-learning as a 'synchronous and asynchronous communication for the purpose of constructing and confirming knowledge'. Synchronous learning provides for live student-teacher interaction using Internet technologies, while in asynchronous communication, the learners' study at their own pace [2].

With the advancement in technology, learning institutions are faced with the challenge of how to integrate these technologies, especially in their teaching [3]. E-learning technology has evolved from use of Compact Disks/Digital Versatile Disks to video conferencing, virtual learning environments to mobile learning, where mobile devices such as laptops and mobile phones are used, to collaborative online learning.

A self-paced mode of learning has been realized, where the learner can study and complete sessions at their own time and location. Learners can study from the comfort of their homes, offices and even recreational facilities among other places.

The evolution of the web has led to a more dynamic and collaborative environment. Web 2.0 is described as a collaborative environment in which users have the opportunity to contribute to a growing knowledge base, assist in the development of web-based tools, and participate in online communities [4]. They enhance e-learning by providing for online participation

in activities such as discussion forums, wikis, podcasts, workshops and chats, and as stated by Orehovacki, Bubas & Konecki [5], the tools can be used to supplement or substitute traditional learning management systems, such as Moodle or Blackboard.

Web 2.0 tools include Social networking, social bookmarking, Really Simple Syndication (RSS), blogs, wikis, mashups, tags, folksonomy and tag clouds and podcasts among others. They allow sharing of images, videos and documents, content production and collaboration, and opportunities to interact in new ways through immersive virtual worlds ([6]; [7]). These tools have brought about a revolution in e-learning leading to innovative ways of teaching with the users having more interaction and collaboration.

The goal of an e-learning system is to equip the learner with relevant content and to provide an easy-to-use interface. However, some multimedia-based systems do not provide for sufficient learner-content interactivity.

This makes online learning passive and lacks the motivation aspect brought about by online collaboration.

A study conducted by Mbatia [8] on online social media applications revealed that discussion boards and online blogs have the potential to contribute to aspects of both constructivist (creating own understanding/new knowledge through existing knowledge) and observational learning (based on a model, such as a teacher). Both discussion boards and blogs are part of the tools in Web 2.0 technology. Some key issues facing both instructors and students in e-learning include lack of skills in e-pedagogy, low level of online collaboration and low level of response to online activities [9]. Web 2.0 tools can be used to respond to these issues as they are not only easily accessible, but also provide a variety of methods for enhancing online communication and collaboration.

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According to Solomon & Schrum [4], many educators are discovering how Web 2.0 tools, such as educational blogs, wikis and podcasts could provide students with opportunities for greater learner control, active construction of knowledge, and access to collaborative learning environments. This study therefore seeks to fill the knowledge gap by identifying the factors influencing the use of these tools in e-learning in Kenyan universities. The study seeks to answer the following questions:

- 1) Which tool(s) and social networking sites are used for e-learning in Kenyan Public Universities?
- 2) What perspectives and challenges does the learner experience when using Web 2.0 tools?
- 3) What factors influence the use of Web 2.0 tools in e-learning in Kenyan Public Universities?

2. LITERATURE REVIEW

The key issue in education today is not access to more information. Students in the digital age are already bombarded with too much information. It is increasingly difficult to sift through the vast amounts of information in order to locate what is significant. One of the goals of e-learning is to provide better ways to make sense of the access to large amounts of information [1].

In a survey conducted in Kenya, Tarus, Gichoya & Muumbo [10] found that there was a lack of interest and commitment among the teaching staff to use e-learning, and that teachers also found it time consuming to develop e-content. Similar studies also reported that management of LMS content was solely left to the educators, therefore limiting its impact in the production of new models of teaching and learning [11]. In addition, Dron argues that Learning Management Systems place students at the “bottom rung of the ecological hierarchy” [12]. These systems do not provide an opportunity for students to control their learning activities [12].

In order for e-learning to be considered as a quality and important aspect of education, it must prove that it is “more than a medium to conveniently access content” [1]. The solution, according to Dunlap & Lowenthal [13], can be found by use of Web 2.0 tools due to their ability to make “lifelong learning possible in ways that typical Learning Management Systems- with their highly bounded, asynchronous, threaded, and removed from professional-context structure- cannot”.

E-learning is gaining universal acceptance as a viable means of enabling large numbers of students to access education [14]. Going through a variety of Kenyan Universities’ websites shows that e-learning is being offered as an alternative mode of study. In Kenya, e-learning has been adopted by both public and private Universities. The adoption is still at a slow rate due to the challenges facing its successful implementation.

However, both blended and mobile learning are carried out in various Universities.

The pedagogy commonly used in Kenyan Universities is the use of LMSs which limit innovation due to their centralized and hierarchical structures [11]. A report commissioned by the Higher education academy in the UK indicated constructivism and connectivism as the two pedagogical approaches that align most closely with Web 2.0 practice. It further stated that the focus of these approaches was to enhance student experience and creativity of use [7].

A study conducted by Tarus, Gichoya and Muumbo [10] on the challenges of implementing e-learning in Kenya revealed four public Universities that have started e-learning implementation. These are: University of Nairobi, Kenyatta University, Moi University and Jomo Kenyatta University of Agriculture and Technology. University of Nairobi offers e-learning via a multimedia portal in which students can access handouts, upload assignments and participate in online discussions within a group and have real time discussions with other students online.

Kenyatta University has a Digital School of Virtual and Open Learning (DSVOL) that offers distance e-learning for students who are unable to take up full time programmes. It has also incorporated Adaptive management systems where students are given tablet devices that contain the learning material. Using these devices, students can submit their assignments online as well as engage in interactive collaboration using chats and forum discussions.

Web 2.0 tools are used for creation of networks and emphasize on online sharing and collaboration [15]. Some of the benefits of using Web 2.0 tools in an Open Distance Learning (ODL) environment include: Collaboration, openness, evolving content, user-created websites, user control, social networking, self-publishing platforms, cloud computing, dynamic content, participatory culture, easy and quick communication, online survey creation and cost reduction [16].

2.1 Social Networks

They enable social relations among groups of students who share similar courses and can be used to establish connections with the students. Madge et al. & Selwyn [7] explored the application of social networking in formal educational contexts and established its support for interaction between learners, peer support and allowing for student discussions to address problems faced during their studies.

2.2 Podcasts

Orehovacki, Bubas & Konecki [5] define Podcasting as a ‘method of digital recording of audio or video files and their distribution over the web’. They further noted that the main benefit of a podcast was to allow students to download content that they would like to

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know more about from specialized web services, and play them on the device of their choice. The benefit of broadcasting over the Internet offers both instructors and students the ability to access and provide feedback on global content [15].

2.3 Wikis

As posited by Conole & Alevizou [7], Wiki educator has been used for experimental purposes as well as publishing in a variety of fields for all levels of education. It allows for collaborative writing of documents, capacity building, free content development and establishment of community networks.

2.4 Blogs

As pointed out by Mbatl [8], online blogs stimulate the reflection criteria for constructivist learning. Blogs allow for chronological publishing of discussions which are known as posts, and are open to the public to read and to interact with. Learners can therefore give their feedback/comments on blog posts and express their opinions.

2.5 Social Bookmarking

Social bookmarking is used to facilitate the recall, identification and exchange of resources on specific topics of interest [17]. It is a web service for sharing Internet bookmarks, and allows for storing, organizing and managing web pages. Learners can help other learners find a site by tagging the site using specific keywords.

2.6 Mashups

A mashup is a webpage that combines from two or more websites create a single website for its consumers. A student from one location can gain access to all forms of information required in order to acquire new knowledge, hence providing the benefit of efficiency in accessing learning content [5].

This study involved the use the Unified Theory of Acceptance and use of technology (UTAUT) model.

The model is based on eight Technology acceptance theories or models, which include: Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivational Model, the Theory of Planned Behavior (TBP), the combined TAM and TBP, the model of Personal Computer Utilization, the Innovation Diffusion Theory and Social Cognitive Theory [18]. This model incorporates four moderators to account for dynamic influences. They include gender, age, voluntariness, and experience [19].

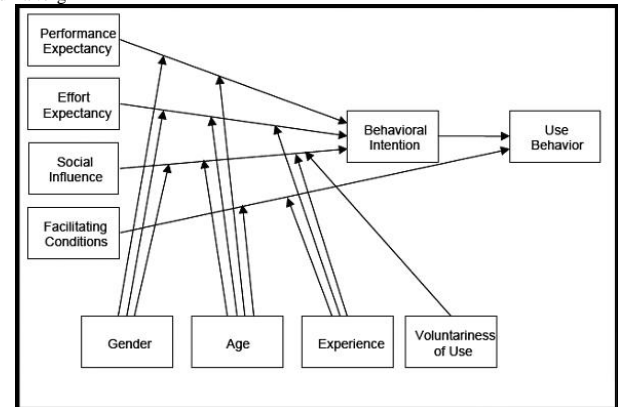


Figure 1: The UTAUT model (Venkatesh et al., 2003)

The UTAUT model has four constructs:

Performance Expectancy: The extent to which an individual believes that using the tools will help him/her expand their knowledge (or gain) during e-learning.

Effort Expectancy: The ease of use of Web 2.0 tools.

Social Influence: The extent to which the individuals believe that important others believe they should use these tools.

Facilitating conditions: The perceived extent to which the organizational and technical infrastructure required for the support of the use of these tools exists.

Four moderators, which include gender, age, experience with similar systems and voluntariness, are used to influence the dependent and independent variables of user acceptance. Voluntariness refers to the extent to which potential adopters perceive the adoption decision to be non-mandatory.

Performance expectancy, effort expectancy and social factors have direct effects on behavioral intention (the extent to which the individual has formulated conscious plans to perform or not perform some specific future behavior). When these constructs are combined together with facilitating conditions, they have direct effects on use behavior [18].

The UTAUT model integrates eight Technology Acceptance models. It is therefore a comprehensive model that can be used for analyzing user perspectives based on the four constructs: Performance expectancy, effort expectancy, social influence and facilitating conditions.

The model can also be used to evaluate the success of new technology [20]. Since the use of Web 2.0 tools in e-learning in public Kenyan Universities is relatively new, this model is applicable in order to understand the factors influencing the use of these tools in order to determine whether they can be integrated as part

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of the existing Learning Management Systems. Moreover, the model has shown robustness and validity with regard to new IT innovations [21].

3. METHODOLOGY

3.1 Research Design

Descriptive survey research design was used for the study. A questionnaire was the main instrument for data collection.

3.2 Data Collection

Data was collected from the Public Universities conducting e-learning in Kenya, in the county of Nairobi.

The Universities included University of Nairobi (UoN), Kenyatta University (KU), and Jomo Kenyatta University of Agriculture and Technology (JKUAT).

Purposive sampling was used for the selection of the respondents who included e-learning instructors and students.

The population for the study included two e-learning instructors and two students from each academic year. These participants were selected due to their familiarity with e-learning, therefore being either being conversant with use of Learning Management Systems or having knowledge of Web 2.0 tools. Other characteristics included gender, as the selection involved both male and female respondents, as well as variations in the age bracket which may be different from one year of study to another. Data was collected from the Faculty/Schools offering e-learning in the selected Universities. This gave a total of 28 Faculties/Schools (Source: Websites), and therefore 280 questionnaires to be filled out.

Data was collected using structured questionnaires. The questionnaires had two sections.

Section A was used for background information of the respondent, and their experience in use of the tools.

Section B was used to collect data on the factors influencing the use of Web 2.0 tools used for e-learning in Kenyan Universities, using the UTAUT model. The four factors, Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions were found to be internally consistent and reliable with a Cronbach's coefficient alpha value at .800.

The survey was conducted in Nairobi County. This area was selected because out of the 22 Public Chartered Universities accredited by the Commission for the University Education, 9 of these Universities are located in Nairobi and 3 of them offer Open Distance and e-learning (ODEL) as a mode of study. The sample can therefore be used to represent public Universities in Kenya.

3.3 Data Analysis

Data collected was analyzed using SPSS and Microsoft Excel programs. This analysis entailed use of both descriptive and inferential statistics. The results were used to determine the factors influencing the use of Web 2.0 tools in e-learning.

4. RESULTS

A descriptive survey research design was used for the study in order to compare data across subsets of the chosen sample. The respondents were required to use a Likert scale of 1-5 (1= strongly disagree; 2=Disagree; 3= Undecided; 4=Agree; 5= strongly agree) to rate the factors influencing the use of Web 2.0 tools in online learning. The data was analyzed using SPSS version 20.0 and Microsoft Excel 2007 software. Out of the 280 respondents targeted in the study, 184 (65.7%) respondents completed the questionnaire. Out of the 56 staff members targeted in the study, 48 (85.7%) respondents returned the questionnaire, and 136 (60.7%) of the 224 students returned the questionnaire.

From the findings, the following were achieved: The first objective identified Social networks as the most frequently used tools for e-learning. This could be possible as social networking sites are voluntarily used by both students and staff for other non-academic purposes.

YouTube was identified as the most commonly used social networking site for online learning. This was followed by Facebook and Twitter. Ahmed, Abdel Almunem & Almabhouh [22], in their study on the use of Web 2.0 tools in University teaching found that faculty members used YouTube videos to search for relevant content for both teaching and learning. Similar studies also support the use of Facebook and Facebook groups for collaborative learning as well as providing for increased communication and student participation ([11]; [23]).

The second objective noted the learner perspectives and challenges faced when using Web 2.0 tools. Social networks were perceived to be the easiest tools to use, but also seen as having the capability to easily divert students' attention into non-academic work. The study also found that both students and staff used Wikis and Podcasts was to gain new knowledge; however, not all information in Wikis was found relevant, or suitable for academic purposes. Blogs were also considered to be tools lacking authoritative academic referencing due to having different perspectives on the same subject. Social bookmarks and Mashups were found to be the least common tools used for online learning.

Apart from slow Internet connectivity, privacy issues, lack of quality content, vast amounts of information and lack of sufficient knowledge in using the tools, were identified as some of the challenges facing both students and staff. These challenges can be addressed individually during the integration of the tools, as they cannot be generalized for all tools, except for the challenge of slow Internet connectivity.

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The third objective identified Performance expectancy and Social influence as the most important factors influencing the use of Web 2.0 tools in Kenyan Public Universities. These findings imply that both students' and staff perceive these tools as adding to their knowledge and building their relationships. A study by Abu-Al-Aish & Love [20] investigated the factors influencing students' acceptance of m-learning in higher education using the UTAUT model, and also identified Performance expectancy as a significant factor affecting the behavioral intention to use m-learning.

A study conducted on student perception of social media use in academic success found that students used social media to connect with their peers and faculty.

The study also indicated that social media helped create strong relationships between students [24]. This implies that social influence is a key factor influencing the use of Web 2.0 tools, thereby motivating students towards learning. The least common factors that influence the use of Web 2.0 tools in e-learning in Kenyan public universities were found to be Facilitating conditions, and Effort Expectancy.

5. CONCLUSION

While these results are not conclusive, and can therefore not be generalized to all Universities in Kenya, they can be used by University stakeholders, that is, Administrators, Lecturers and Students, to make informed decisions towards the integration of the tools. It is evident from the study that both instructors and students are conversant with the tools. There however needs to be a way of integrating the tools as part of the learning. A study conducted by Lwoga [25] on making learning and Web 2.0 technologies work for higher learning institutions in Africa recommends working together with students in order to incorporate experimentation, collaboration and teamwork, and enhance positive tutor/student relationships. Universities should therefore provide formal environments where the tools can be used for online collaboration.

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